

## PATENT COOPERATION TREATY

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**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PU02112-PCT	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP 03/14317	International filing date (day/month/year) 16.12.2003	Priority date (day/month/year) 17.12.2002
International Patent Classification (IPC) or both national classification and IPC G02B6/35		
Applicant AMERSHAM BIOSCIENCES AB et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
  
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
  - This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.
  
3. This report contains indications relating to the following items:
  - I  Basis of the opinion
  - II  Priority
  - III  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV  Lack of unity of invention
  - V  Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI  Certain documents cited
  - VII  Certain defects in the international application
  - VIII  Certain observations on the international application

Date of submission of the demand 02.07.2004	Date of completion of this report 24.03.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Müller, T  Telephone No. +49 89 2399-2285



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP 03/14317

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-8 as originally filed

**Claims, Numbers**

1-7 received on 08.02.2005 with letter of 08.02.2005

**Drawings, Sheets**

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

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5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).  
*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*
6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-7
	No: Claims	
Inventive step (IS)	Yes: Claims	1-7
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-7
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

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**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following document:

D1: DE 195 15 375 A (QUALICO PROZESUEBERWACHUNGSSYS) 7 November 1996 (1996-11-07)

2. The document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and shows (the references in parentheses applying to this document):

A multiplexer for electromagnetic radiation (see title of D1) comprising a first part (4) with two through holes (5) for wave guides and a second part (1) with two rows of 10 parallel pairs of through holes (2) that is a plurality of through holes. The first part is on a sledge and movable by a stepper motor (see column 3, line 34-62 and figures 1 and 2).

The subject-matter of claim 1 differs from this known multiplexer in that a liquid analysis system comprising a plurality of sample containing units is employed which comprises a multiplexer.

3. The subject-matter of claim 1 is therefore new (Article 33(2) PCT).
4. The problem to be solved by the present invention may be regarded as the monitoring of a plurality of sample containing units in a fraction collector in liquid chromatography.
5. The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

Prior art fraction collectors are monitored either by multiple detectors or a valve system is employed to feed a single detector in a single column. No hint is given in the prior art according to the search report, to combine the known optical multiplexer

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according to D1 with a fraction collector.

6. Claims 2-7 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Claims

1. Liquid analysis system comprising a plurality of sample containing units (207a-207n) characterised in that it comprises a multiplexer for electromagnetic radiation comprising:
  - 5 a first part (253) provided with a first outward through hole (263) connectable to a source of electromagnetic radiation (203) and a first return through hole (265) connectable to a detector of electromagnetic radiation (223), wherein said first outward through hole (263) and said first return through hole (265) are spaced a distance D apart;
  - 10 a second part (255) provided with a plurality of second outward though holes (273(1)-273(n)) and a plurality of second return through holes (275(1)-275(n)) wherein said second outward through holes (273(1)-273(n)) and said second return through holes (275(1)-275(n)) are arranged in equidistantly spaced apart pairs (273(1), 275(1); 273(2), 275(2);... 273(n), 275(n)) of second outward and return through holes, with each second outward hole (273(x)) at a distance D from its second return through hole (275(x));
  - 15 wherein said first part (253) is movable relative to said second part (255) from a first position P1 in which first outward through hole (263) is aligned with a second outward through hole (273(1)) and said first return through hole (265) is aligned with a second return through hole (275(1)), to a second position Px in which first outward through hole (263) is aligned with another second outward through hole (273(x)) and said first return through hole (265) is aligned with another second return through hole (275(x)).
  - 20
2. Liquid analysis system in accordance with claim 1 characterised in that said second outward through holes (273(1)-273(n)) and said second return through holes (275(1)-275(n)) are arranged in two parallel rows.
- 25
3. Liquid analysis system in accordance with any of the previous claims characterised in that it is provided with an actuator (281) for moving said first part (253) relative to said second part (255).
- 30
4. Liquid analysis system in accordance with claim 3 characterised in that said actuator comprises a voice coil.

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5. Liquid analysis system in accordance with claim 3 characterised in that said actuator comprises an electric motor.

6. Liquid analysis system in accordance with any of the previous claims characterised in that  
5 some or all of said through holes (263, 265, 273(1)-273(n), 275(1)-275(n)) are wave guides.

7. Liquid analysis system in accordance with any of the previous claims characterised in that  
the second outward through hole (273(x)) in each pair of equidistantly spaced apart pairs  
(273(1), 275(1); 273(2), 275(2);... 273(n), 275(n)) of second outward and return through  
10 holes, is connectable to an inlet port (209(x)) in a sample-containing unit (207(x)) and the said  
second return through hole (275(x)) from the same pair of second outward and return through  
holes (273(x), 275(x)) is connectable to an outlet port (213(x)) in the same sample-containing  
unit (207(x)).